ER Site No. 76: Mixed Waste Landfill

ADS: 1289
Operable Unit: Mixed Waste Landfill

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Site History

The Mixed Waste Landfill (MWL) is located approximately 5 miles southeast of Albuquerque International Sunport, and 4 miles south of Technical Area (TA) 1. The site covers 2.6 acres in the north-central portion of TA 3.

The MWL was established in 1959 as a disposal area for radioactive and mixed wastes generated at SNL research facilities. The landfill accepted low-level radioactive waste and minor amounts of mixed waste from March 1959 through December 1988. Approximately 100,000 cubic feet of radioactive wastes containing approximately 6300 Ci of activity (at the time of disposal) were disposed of at the MWL.

The MWL consists of two distinct disposal areas. The classified area, occupying 0.6 acres, and the unclassified area, occupying 2.0 acres. Wastes known to have been disposed of in the classified area include solidified acids, organic compounds, and oils; DU; lead shielding; activation products; beryllium; sodium; lithium; neutron generator tubes; and empty liquid scintillation vials. These wastes were disposed in 36 pits up to 25 feet deep. Wastes known to have been disposed of in the unclassified area include assorted contaminated equipment; decontamination materials; lead shielding; construction debris; contaminated soils; and miscellaneous solid wastes. These wastes were disposed of in seven trenches, typically 15 ft deep, 20 ft wide, and up to 180 ft long. The exact depth of each trench is unknown.

In 1967, approximately 204,000 gal of coolant waste water from the Sandia Engineering Reactor Facility was disposed of in Trench D. Approximately 1 Ci of total radioactivity, mainly short-lived radionuclides, was discharged into the trench with the cooling water. Because the disposal occurred in 1967, the short half-lived activation products have decayed to below detectable levels.

Tritium is the contaminant of primary concern at the MWL. Tritium exists in surface soils and to depths of 110 feet below ground surface. Tritium has migrated beyond the fenced boundary of the landfill. The tritium in soils at the MWL do not pose a threat to human health or the environment.

Constituents of Concern

Tritium is the contaminant of primary concern at the MWL. Tritium has been detected above background levels in soils to depths of 110 ft. No elevated levels of tritium, or any other contaminants, have been detected in groundwater, which is approximately 500 ft below ground surface. Tritium has been a consistent finding at the MWL since 1969. Tritium exists in surface soils and to depths of 110 feet below ground surface. Tritium has migrated beyond the fenced boundary of the landfill. The tritium in soils at the MWL do not pose a threat to human health or the environment.

Current Hazards

All waste at the MWL is below surface. Geophysical surveys are available that delineate trench boundaries. The only contaminant identified in surface and sub-surface soils is tritium. Tritium levels range from 1100 pCi/g in surface soils to 206 pCi/g in subsurface soils. The highest tritium levels are found within 30 feet of the surface in soils adjacent to and directly below classified area disposal pits. Because of tritium's short half-life, radioactive decay will eliminate tritium's threat to groundwater. Tritium also occurs as a diffuse air emission from the landfill releasing 0.294 Ci/yr to the atmosphere. The effective dose equivalent exposure to receptors from air emission of tritium from the MWL is 10-6 mrem/yr.

Current Status of Work

A Phase 1 RFI was conducted in 1989 and 1990 to begin characterizing the MWL and the nature and extent of contamination. This investigation included walkover surveys for radiation and VOCs; surface soil sampling; air sampling; and the drilling of 18 boreholes to depths of up to 150 ft around the landfill perimeter. Soil samples from the boreholes were analyzed for metals, radionuclides, VOCs and SVOCs. This investigation identified tritium as the contaminant of primary concern.

In March 1993, SNL submitted a Phase 2 RFI Work Plan to the EPA. The EPA responded with comments and a Notice of Deficiency (NOD) to SNL in September 1994. SNL submitted responses to the EPA NOD in November 1994. EPA approved the Phase 2 RFI Work Plan in May 1995.

A monitoring well network consisting of seven wells has been installed at the MWL. The network includes one background well, five downgradient wells, and one angled well beneath Trench D in the northern half of the unclassified area. All wells are sampled annually in April for radionuclides, metals, VOCs, and major ion chemistry.

Long-term air monitoring has been conducted at the MWL for particulate radionuclides as part of SNL/NM's NESHAP monitoring program. State and federal air quality standards have not been exceeded at the landfill. Air-monitoring has been discontinued due to negative findings of radionuclides.

Completed Work:

The Phase 2 RFI Work Plan characterization activities were completed in December 1995. Field characterization activities included determining background levels of metals and radionuclides in soils near the MWL; delineating pit and trench boundaries with surface geophysics; conducting passive and active soil gas surveys for VOCs; surface soils sampling for tritium and radionuclides; drilling 15 angled boreholes around the landfill perimeter; subsurface soil sampling for radionuclides, metals, and organic compounds; measuring soil hydraulic and physical parameters in the field and laboratory; and conducting a baseline risk assessment.

The Phase 2 RFI Report was submitted to the New Mexico Environment Department (NMED) and the EPA in September 1996. The MWL was proposed for No Further Action, continued groundwater monitoring, and institutional controls. The NMED responded to the Phase 2 RFI Report by issuing a "Denial" in September 1997. The NMED requested a formal RCRA Closure Plan, a Post-Closure Permit Plan Application, a RCRA Subtitle "C" Cap for the landfill, and responses to 85 technical comments.

The NMED technical comments were addressed in June 1998 and January 1999. The Closure Plan was addressed in September 1999 with the submittal of the MWL alternative cover design. The Post-closure Plan will be written in collaboration with the NMED once the Closure Plan is accepted. The MWL is currently undergoing a corrective measures study (CMS). The DOE and SNL/NM were directed to conduct a CMS by the NMED in October 2001. The CMS will consist of a CMS Plan, a CMS Report, and a CM Implementation Plan. The CMS Plan was submitted to the NMED on December 19, 2002 and approved on October 10, 2002. The CMS Report is scheduled to be submitted to the NMED on February 28, 2003. The entire CMS process will require approximately 2 years to complete.

Future Work Planned

The MWL technical staff has recommended to SNL management and the DOE that if the landfill is to be "covered", the most viable option is a vegetated soil cover. A soil cover would be an inexpensive alternative to the RCRA Subtitle "C" cap requested by NMED in the September 11, 1997 "Denial". The DOE and, more importantly, the NMED must approve of the alternative cover technology. The MWL technical staff has embarked on a strategy to prepare the landfill for a vegetated soil cover. This strategy includes DOE and NMED approval of the soil cover. FY 1998 and FY 1999 saw all the necessary preparations and documentation for cover acceptance and deployment. The NMED issued a Request for Supplemental Information (RSI) in April 2000. The RSI was addressed in June 2000. Actual construction of the cover will commence upon NMEDs approval pending the CMS process. Following deployment the MWL vegetated soil cover will be monitored for infiltration and subsidence for a minimum of 30 years.

Groundwater monitoring at the MWL will continue on at least an annual basis for the foreseeable future.

Waste Volume Estimated/Generated

To date, three 55-gallon drums of hazardous waste (soils contaminated by diesel fuel or hydraulic fluid) and forty-eight 55-gallon drums of radioactive waste (soils contaminated by low levels of tritium) have been generated at the Mixed Waste Landfill. These wastes were generated from drilling and sampling activities.

Information for ER Site 76 was last updated Jan 7, 2003.